

Topic: Food Security

Understanding the global food supply

“There are 925 million undernourished people in the world today. That means one in seven people do not get enough food to be healthy and lead an active life. Hunger and malnutrition are in fact the number one risk to the health worldwide — greater than AIDS, malaria and tuberculosis combined.” – World Food Programme

STATEMENT OF THE PROBLEM

The Food & Agriculture Organization estimated that in 2010 there were 925 million people around the world who were undernourished. The majority of this population lived in **developing**¹ areas such as sub-Saharan Africa, Asia and the Pacificⁱ; however, hunger does not only affect developing areas. **Developed**² countries also face rising food prices and under-nourished citizens. A decrease in the number of rural farmers, war, poverty, population growth, environmental degradation, limited technology, ineffective policies and disease all effect access, availability, and sustainability of good nutritious food around the world. ⁱⁱ

FOOD SECURITY

According to the Food & Agriculture Organization, food security exists when, “all people, at all times, have physical and economic access to sufficient, safe and nutritious food for a healthy and active life”.ⁱⁱⁱ Achieving food security depends on four basic factors:


- the availability of food,
- the stability of the food supply,
- the accessibility and affordability of food, and
- the quality and safety of food. ^{iv}

Without these four criteria in place, food security is jeopardized. Domestic food production, the amount of food a country grows for itself, is the most important component of national food security for many countries. Domestic food production feeds the farmers producing the crops. The surplus, or extra crops are sold to provide addition income for the farmers, which can be used to pay the wages of agricultural workers. The surplus of crops is made available for purchase by the non-farming and urban members of the community. A stable food supply is what allows civilizations to grow and cities to develop; without a food surplus, no one would be able to work in a profession because everyone would have to grow food for their own survival.

There are many risks associated with agriculture because crops are subject to the vagaries of

¹ **Developing**: countries with low income in comparison with other parts of the world, low standard of living, and has an undeveloped industry.

² **Developed**: countries with a high level of development, where people have a higher standard of living with access to more materials and services.



weather, which cannot be predicted. In addition to drought and flooding which can ruin crops and negatively affect the food supply, human disruptions like war can limit a nation's ability to achieve food security. Even in nations at peace, poverty can prevent people from being able to access food because they have no money to buy it. Putting further stress on the global food supply is the incredible population growth in developing countries, and environmental changes such as desertification.

In fact, environmental disasters in a number of the world's top wheat growing nations have had a serious global impact: severe droughts in China in 2010, record high temperatures in India and Russia, extreme cold weather and drought in France, and flooding in Australia and Pakistan, have all reduced the quantity of crops being produced. This, in turn has created a great deal of instability in the global food supply.^v

The issue of food security is not a recent topic of concern. Throughout history; droughts, food shortages, war, population growth, and urbanization have affected the availability, access, and stability of the food supply.

HISTORY OF THE ISSUE

INDUSTRIAL REVOLUTION

The Industrial Revolution was a time of growth and modernization, which affected almost every part of life, including food availability, access and quantity. During this time, new developments in transportation and food preservation techniques enabled a massive shift in food production. Technological advances in transportation, such as the steam ship, made it faster to ship goods over longer distances. Roads were also improved during this time period, which made overall land transportation significantly easier. Although trains did not exist until 1801, which is the year that the first steam locomotives were created, horse-drawn wagons were used to pull freight cars on rail tracks.^{vi} All of these innovations in transportation made it possible to move food from one part of a country to another. New advances in food preservation-such as canning techniques, pasteurization, and dehydrated food- prevented spoilage during the long journeys across greater distances.^{vii}

URBANIZATION

The Industrial Revolution is characterized by a shift in producing goods by hand to producing them in factories by machine. With machines producing goods so much faster, cheaper, and easier than before, people began to leave their agricultural lifestyles behind and find work in the new factories in the cities. The Industrial Revolution also led to a parallel increase in the mass production of food. Factory employees working long hours received much of their daily calories from cups of tea and sugar with milk-thanks to the greater availability of those products due to mass production. The process of urbanization greatly changed the dynamic of food, agriculture, and society during this time period.^{viii ix}

WORLD WAR II

Another great change in the realm of agriculture was the introduction of nitrogen based fertilizers. During World War II the United States built new nitrogen plants to produce the TNT used in bombs. After the war, the plants were converted to produce nitrogen based fertilizer,



which

increased agricultural yields.^x This increase in crop yields achieved by the introduction of chemical fertilizers marks the beginning of modern agricultural practices and helped to support the rapidly increasing global population.

This was the first time chemically synthesized inorganic fertilizers had been developed. These fertilizers made it possible to grow large quantities of produce and contributed to agriculture advances such as the Green Revolution.^{xi}

THE GREEN REVOLUTION


The Green Revolution was an agricultural movement that began with scientist Norman Borlaug studying wheat in Mexico. Borlaug was concerned about food security in developing countries where the available crop land was already in maximum cultivation and people were still starving. He devoted his research to the development of high-yielding, disease-resistant wheat that would allow farmers to produce more crops with the limited amount of land they had. The massive increase in crop yields made possible by Borlaug's innovations is known as the Green Revolution. Countries such as India, Mexico and Pakistan adopted Borlaug's seed varieties as well as the chemical fertilizer techniques needed to sustain them throughout the 1960's. He claimed that his success in developing a new type of wheat was, "a temporary success in a man's war against hunger and deprivation," a break in which developing countries bought some time in the fight against food insecurity.^{xii}

The Green Revolution modernized agriculture in developing countries and produced a rural transformation by introducing new technologies such as chemical fertilizer, pesticides, and controlled **irrigation**³. The participating farmers were asked to grow only high-yield wheat, rice, and cotton as opposed to their traditional crops.^{xiii} The high yielding crops allowed farmers to grow more food in less time and with less effort. Irrigation was made possible by deep groundwater sources. The method allowed farmers to grow crops even during the dry seasons, which made land unsuitable for thirsty crops such as rice, available for agricultural purposes.

Although the Green Revolution is best known for increasing food production and rural incomes in India, it was in fact an international event. Mexico, Pakistan, and the Philippines all greatly benefited from the Green Revolution and all three countries had notable increases in cereal-grains production. In addition countries such as, Afghanistan, Sri Lanka, China, Indonesia, Iran, Kenya, Malaya, Morocco, Thailand, Tunisia, and Turkey all benefited from the Green Revolution.^{xiv}

The Green Revolution is not without its critics, however. Expensive pumps were needed to dig to find groundwater for irrigation and many locations are depleting their underground water reserves due to increased water needs. The high-yielding crops have also used up a great deal of the nutrients in the soil, making additional fertilization necessary for continued growth.^{xv} Many farmers abandoned traditional organic methods of agriculture and went bankrupt when they could no longer afford the expensive inputs, or fertilizers, necessary to grow the high-yield varieties of wheat. In India, this led to the infamous rash of farmer suicides where poor farmers

³ **Irrigation:** Redirecting and/or moving water from its natural source to another place in order to use it



that had made the switch to modern agriculture went into debt and couldn't provide their families with basic necessities.^{xvi} The Green Revolution is now seen as a temporary fix, which had only *postponed* the instability of food insecurity. Many experts are looking to more sustainable ways of increasing the food supply.

DISCUSSION OF THE PROBLEM

RIOTS/INSTABILITY

The instability of the global food supply has contributed to much social unrest in the past year, especially in developing countries such as Tunisia, Egypt, and Libya. Most of the riots have occurred in urban areas, where the rising price of food and fuel has had the greatest impact.^{xvii} The rising food prices in 2010-2011 have contributed to the unrest in the Middle East, although they are not the primary cause.^{xviii} Similarly, food price inflation in 2008 caused riots in a number of different countries, such as Haiti and Bangladesh.^{xix} Developing countries are the most strongly impacted by food instability; however vulnerable populations exist among all countries.

CASE STUDY: Egypt

On February 11th, 2011, President Hosni Mubarak resigned from his presidency as the result of numerous riots and protests demanding his resignation.

The demonstrators, mainly young Egyptians, but including a variety of different backgrounds, decided that they had enough of Mubarak's 30 year reign as president, and were ready for a new leader. There were many factors that prompted this unrest; dissatisfaction with Mubarak's repressive regime, anger over corruption within the government, lack of available employment, and rising prices in all sectors including the food industry, were some of the main concerns.^A

About 40% of Egyptians live on less than two-dollars a day which makes the rising food prices a particular challenge. The prices also affect Egypt's economy since it one of the world's biggest importers of wheat. Egyptians also spend an extraordinarily large proportion of their money on food compared with other countries.

This is not the first time that high food prices have contributed to unrest in Egypt. In 1977 there were riots when the government cut food subsidies of basic commodities, and in 2008 protests occurred when prices hit record highs.^B

Although it is not entirely clear if it was a coincidence or not, the World Bank reported record highs in food prices around the same time that protests broke out in both Egypt and Tunisia. The rise in prices is hitting these developing countries the hardest since the people depend on raw food commodities (which have the greatest increases in price) and spend a larger percentage of their income on food.^C

The lack of **availability**, **access**, and **stability** of food supply food security is causing unrest and negatively impacting food security in Egypt, but also the Middle East, and the globe as a whole.

VULNERABLE POPULATIONS

The inability to access and pay for adequate amounts of healthy food affects many different populations; however, the most vulnerable populations are children, adolescents, sufferers of chronic diseases such as HIV/AIDS, the elderly and pregnant women. People suffering from HIV/AIDS often have unique nutritional needs which cannot always be met, while young children can experience long-term developmental problems if they do not receive proper nutrients. Proper nutrition for pregnant women is important for both the mother, and the proper development of the child.^{xx} All of these populations require proper nutrition which is not available in a food insecure area.

DEFINITION OF FOOD INSECURITY

“Food insecurity exists when people do not have adequate physical, social or economic access to food as defined [in food security]”.¹ - **Food & Agriculture Organization**

"[Food Insecurity is] limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways".
- **The U.S. Department of Agriculture**

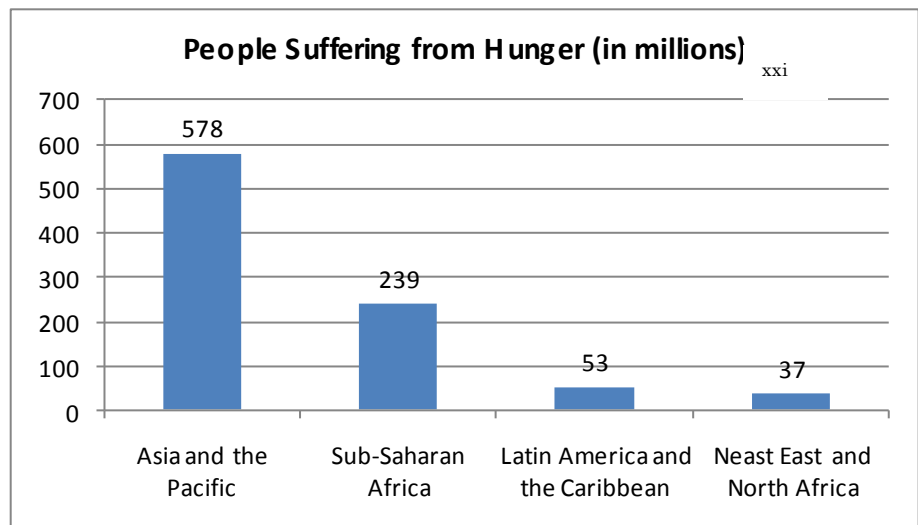
DEVELOPED VERSUS DEVELOPING WORLD

In 2010, twenty-two countries were in **protracted crisis**⁴ and all of those twenty-two countries that were in protracted crisis were developing countries. However, it is important to note that developed countries experience food insecurity as well. ^{xxi}

The face of food insecurity in places like Sub-Saharan Africa is drastically different and more extreme than the face of food insecurity in a developed country. Insecure populations in the developing world can face starvation, increased susceptibility to disease, inability to work, and stunted growth in children.


Food insecurity in the richer countries can result in an overweight population. It

seems like a paradox that people without access to food would be overweight. However, food insecure populations are vulnerable to obesity and the health risks associated with it, because of poverty. Income affects a family's ability to access healthy food and those lacking education may not know how to choose healthy, nutrient-rich foods. The most nutritious foods are often more costly, and not sold in all areas. Processed foods are usually the cheapest, and they are filled with salt and sugar and contain little fiber, vitamins, and nutrients. According to the Food Research & Action Center (FRAC), “households without sufficient money to buy enough food often have to rely on cheaper, high calorie foods to cope with limited money for food and to stave off hunger. Families try to maximize caloric intake for each dollar spent, which can lead to over consumption of calories and a less healthful diet”. ^{xxii}



COMMODITY CHAIN DEPENDENCE

⁴ **Protracted crisis:** characterized by, “recurrent natural disasters and/or conflict, longevity of food crises, breakdown of livelihoods and insufficient institutional capacity to react to the crises”. ^{xvi}



The commodity chain plays an important role in the food security of nations, most of which seek to be able to grow most, if not all, of their domestic food needs. *Commodity chain* is a term used to describe the route that a food product travels from start to finish. That is, the journey from the moment a seed is planted until it is purchased by the consumer at a market.^{xxiii} The different stages that make up the food chain are: producers, transporters, processors, wholesalers, retailers, and consumers^{xxiv}; however, the involvement of each individual stage depends on the nature of the food chain. For example, a farmer (the producer), may skip over the transportation, processing, wholesaling, and retail stages, and instead choose to feed his or her family (the consumers) directly.

Using rice as an example, the availability of rice as a food commodity for the general public is based upon the following factors:

- the profitability of growing rice as opposed to other crops (if farmers can make more money growing corn for biofuel, they will plant corn, not rice, which will cause rice to become more expensive for the public),
- the price according to the export market compared with the price of the domestic market (if people in another country will pay 10 times more for rice than people in the country where the rice is grown, there will less rice for the country growing it because it will be shipped abroad),
- taxes and subsidies created by the government (taxes will make rice more expensive and subsidies will make it cheaper), and
- the ability to make a profit at the end of the process.^{xxv}

Availability is a primary factor in creating a food secure household. Without accessible and nutritious food the population's well-being is threatened. A growing urban population which is almost totally dependent a commodity chain for their food security will be vulnerable to food insecurity if the price of food spikes on the world market due to any of the factors listed above.^{xxvi}

URBANIZATION (PRESENT DAY)

People continue to move into towns and cities in search of jobs and closer proximity to services such as health care and education. Half of the world's population presently lives in towns and cities and the numbers are growing. The least urbanized populations are in Asia and Africa, but even those are expected to shift to a greater urban population (in comparison with a rural population) by 2023 and 2030.^{xxvii} As of 2010, the percentage of the population that was urbanized was:

- Europe was 72.6% urban
- Africa was 40% urban
- Asia was 42.5% urban
- Latin America and the Caribbean was 79.4% urban
- Oceania was 79.6% urban.

There are challenges to ensuring adequate food security for a growing urban population. As people move from the countryside into the city, there are less rural laborers, which makes the

cost of food rise and puts a limit on what can be produced.^{xxviii} The urban population is more susceptible to the ups and downs of the food commodity chain because fewer people are growing their own food and are instead depending on other farmers and manufacturers to produce it.

Food is the greatest expense for the urban poor and world food prices have been rising. The diet of the urban population has the potential to be more nutritious and varied in comparison with the rural diet. However, it also contains processed and prepared foods (some of which have lots of **trans-fats**⁵, **saturated fats**⁶, and large amounts of sodium and sugar) and restricts access to healthy food to select urban, economically stable, populations. Urban populations must also stretch their income across a more varied set of expenses such as energy and transportation.^{xxix}

BATTLING FOOD INSECURITY

FOOD SECURITY TRENDS IN DEVELOPING COUNTRIES

Lack of food causes immense human suffering; the Green Revolution mitigated that suffering by harnessing the power of technology to improve crop yields. Although the techniques employed achieved the desired short term results of increased crop yields and higher productivity, they fell short of being a long-term solution to the problem of food security due to their reliance on large amounts of water and chemical fertilizers. Many agricultural experts are calling for a new Green Revolution to address food insecurity. Many prominent players, including the influential Gates Foundation, are putting resources behind improving seed varieties to make them drought resistant and using whatever technological means available to improve yields, including genetic modification of seeds.



A malnourished child.

Photo by Graeme Dott

FOOD SECURITY TRENDS IN THE RICH WORLD

There are a number of new initiatives to combat poor nutrition and access to healthy produce among urban populations, including a recent movement called the CSA. The Community Supported Agriculture Movement was introduced to the United States from Switzerland by Jan Vander Tuin in 1984.^{xxx} Although popular in Europe, the concept of CSA began in Japan about 40 years ago. The movement was started by a group of women who were troubled by the pesticides used to grow produce, the processed foods appearing on the shelves, and Japan's

⁵ **Trans-fats:** A type of fat that is created artificially by a chemical process. This type of fat is considered bad for one's health.

⁶ **Saturated fats:** A fat that is often found in animal products and foods with hydrogenated fats. They can raise blood cholesterol levels.

diminishing rural population.

The women decided to create annual partnerships with local farmers from whom they could buy their produce. They named their concept, *teikei*, which translates to "Partnership" or "Cooperation".^{xxx} The same concept existed in Chile and parts of Europe and then came to the United States starting with the first two CSA's in Massachusetts and New Hampshire in 1986.^{xxxii}

The CSA Movement condenses the commodity chain process from producers, transporters, processors, wholesalers, retailers, and consumers, to a direct link between producers (farmers) and consumers. The CSA Movement has begun to address the food security of socially disadvantaged groups in the United States as well, by offering farm shares to impoverished people. It is estimated that ten-percent of CSAs are run by **non-profit organizations**⁷.

Nonprofits, such as the Western Massachusetts Food Bank and the Hartford Food Project use community supported agriculture to engage socially disadvantaged individuals in eating healthy, local, and nutritious foods. These programs provide work and training for unemployed persons and fresh food for food banks.^{xxxiii} There are also programs in the United States such as the WIC Farmers Market Nutrition Program, which allows eligible women, infants, and children, to access, "[a] variety of fresh, nutritious, unprepared, locally grown fruits, vegetables and herbs, which may be purchased with FMNP coupons"^{xxxiv}. Programs such as these act as local food security nets and provide proper nutrition to populations that may otherwise not have access.

LOCAL FOOD SECURITY NETS


Local food security nets address food insecurity with a variety of locally based organizations and programs. Crisis response and safety nets include assistance in the form of food vouchers, employment programs and insurance designs. Specifically targeted programs are necessary to address the nutritional status of pregnant and lactating women, children less than five years of age and people living with HIV/AIDS or tuberculosis.^{xxxv}

According to the Food & Agriculture Organization, social safety nets refer to, "in-cash or **in-kind**



Crops in a typical weekly farm share from a CSA

⁷ **Non-profit organization:** an organization that uses its earnings to further its cause and not to make a profit



⁸transfer programs that seek to reduce poverty by redistributing wealth and/or protecting households against income shocks". Food safety nets are a subset of social safety nets and, "aim to assure a minimum amount of food consumption and/or protect households against shocks to food consumption".^{xxxvi} It is important that local community organizations and governments create and sustain programs which will ensure the health of their citizens. These programs should facilitate equal economic and physical access to healthy, nutritious food. Some examples of government local food security nets are subsidies, welfare programs, and public health policies.

Non-governmental organizations (NGOs) work internationally and locally, generally in countries with, "weak infrastructure and low administrative capacities".^{xxxvii} NGOs provide targeted aid to specific groups that complement government efforts to alleviate food insecurity and poverty in their country. Technical assistance is provided to farmers to help them improve crop yields and food distribution programs are run to benefit children and other vulnerable populations.

PAST INTERNATIONAL ACTIONS

The International Community plays an important role in the fight to end global food insecurity. Over the past few decades there have been numerous conferences and proposals to create a more food secure world. The major proposals and conferences have been organized by two major organizations: the World Food Programme and the Food and Agriculture Organization.

THE WORLD FOOD PROGRAMME AND THE FOOD & AGRICULTURE ORGANIZATION

The World Food Programme is also known as the "food aid arm of the United Nations". Food aid promotes food security, which is necessary to eradicate world hunger. All of the WFP policies address the alleviation of world hunger and poverty. Their policies help both populations in temporary crisis and populations in which food insecurity is part of their everyday lives. The WFP also reflects the principle of **universality**. It uses food aid to support both economic and social development, promotes food security in accordance with the suggestions of the United Nations, and it aims to meet the needs of emergency situations across the globe.^{xxxviii}

The Food & Agriculture Organization is another specialized agency of the United Nations and an important international leader in the fight for global food security and equality. The FAO serves both developed and developing countries and acts as a neutral forum where different nations can meet and discuss policies related to food and agriculture. A special attention is given to rural areas, which are home to seventy-percent of the world's poverty stricken and hungry populations.^{xxxix}

THE TWIN TRACK APPROACH

The Food and Agriculture Organization (FAO), the World Food Programme (WFP), and the International Fund for Agriculture Development (IFAD), have come together to form the Twin Track Approach in the fight against hunger. The Twin Track Approach addresses food security on both a short-term and long-term basis. It is important to alleviate the effect of high food prices on the poorest populations while continuing to implement long-term policies and programs which promote agricultural development, employment, food production and

⁸ **In-kind:** payment in the form of services or goods as opposed to a monetary payment



access.^{xi} Both the long-term and short-term goals will hopefully help attain the goals set up by another important international conference called the World Food Summit.

THE WORLD FOOD SUMMIT

The World Food Summit took place in 1996 and was the largest global conference to address hunger and food security up until that point. The summit was attended by delegations from 172 countries as well as the European Commission. The summit called for an international response to the problem of global hunger. It was decided, during this summit that the international community would take a pledge to cut the number of hungry people worldwide to about 400 million by 2015.^{xii} The Twin Track Approach is an example of one of the many possible solutions being used to obtain this, rather difficult, goal.

DOHA

Another well-known conference, known as The DOHA Rounds, first began in 2001 in Doha, Qatar, as part of the World Trade Organization Fourth WTO **Ministerial Conference**⁹. The goal of the Rounds was to improve the world economy while stimulating growth in developing countries via trade. The Rounds focused on six major areas, one of them being agriculture.^{xiii} The first negotiation on agriculture occurred in 2000, one year before the first DOHA round. By 2001, when the DOHA Rounds began, 121 different governments had already submitted numerous negotiating proposals.^{xiii} The DOHA Rounds continued in Cancun in 2003, Geneva in 2004, Hong Kong in 2005, and Geneva in 2006 & 2008. The talks paused in 2008 when there was a disagreement over agricultural imports, but according to Peter Sutherland, the former WTO director general, the goal is to complete the DOHA Rounds negotiations by the December of 2011.^{xiv}

RECOMMENDATIONS FOR FORMULATING A RESOLUTION

Some recommendations made by the Food and Agriculture Organization include on behalf of the World Food Summit and the FAO Anti-Hunger Program (under the branch of the WFS) that delegates may want to take into consideration are^{xiv, xvi}:

- The need for different governments to work together to develop guidelines to achieve the right to food
- The decline of agriculture and rural development in the national budgets of developing countries
- The need for contributions to the FAO Trust Fund on Food Safety and Food Security
- The degree of investment in agriculture and rural development
- The level of undernourishment in the most affect countries and those countries' need for immediate access to food
- The level of expansion of rural infrastructure The call for the creation of more sustainable opportunities for rural workers/people

⁹ **Ministerial Conference:** the main decision making branch of the World Trade Organization (WTO)

QUESTIONS TO CONSIDER

- *Is your country food secure?*
- *Is public opinion regarding this issue different from that of the government?*
- *How has the global financial crisis and rising prices impacted your country?*
- *Has your country experienced any food riots or revolts in connection with food security?*
- *Did your country participate in the DOHA Rounds or the World Food Summit?*
- *Has your country initiated domestic programs to address food insecurity?*
- *Who should take responsibility for addressing world hunger?*

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